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Mazdoor Kisan Shakti Sangathan

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Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11152 (1984): Laboratory Stands (Metallic) [PGD 22:
Educational Instruments and Equipment]



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Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard
SPECIFICATION FOR
LABORATORY STANDS (METALLIC)

• UDC 542.242



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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR LABORATORY STANDS (METALLIC)

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Indian Standard

SPECIFICATION FOR LABORATORY STANDS (METALLIC)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 1 November 1984, after the draft finalized by the Educational Instruments and Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 Laboratory stand is used for holding apparatus, such as funnel, flask, burettes, etc, to carry out tests in laboratories. Laboratory stands are of two types, namely, metallic and wooden. This standard covers the metallic stand only.

0.3 In the preparation of this standard due consideration has been given to the requirements prescribed by the National Council of Educational Research and Training, New Delhi.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the general and functional requirements of the metallic laboratory stand (*see* Fig. 1).

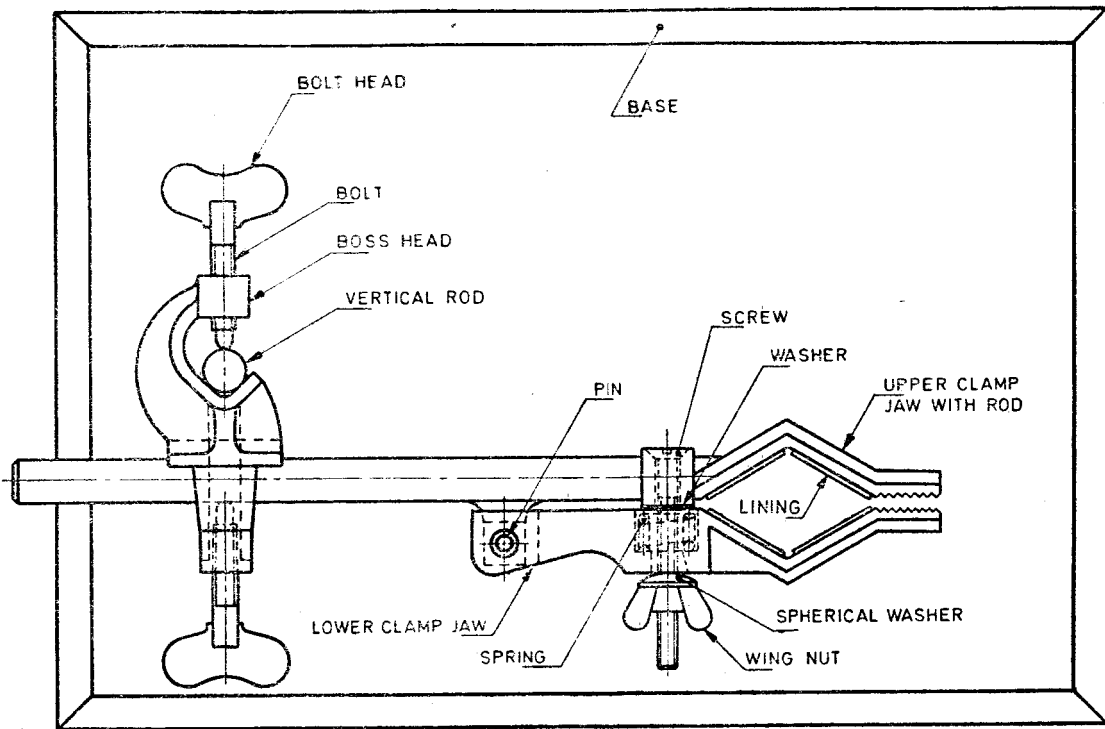
2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Base — A heavy metallic block with provisions for fitting a vertical rod.

2.2 Boss-Head — A device for holding the clamp in desired position.

*Rules for rounding off numerical values (*revised*).



NOTE — The figure is only illustrative and is not intended to restrict the actual design of the components.

FIG. 1 LABORATORY STAND (METALLIC)

2.3 Clamp — A device for holding laboratory apparatus with the help of its jaws, the opening of which is adjustable.

2.4 Lining — A soft material provided in the jaws of the clamp to give cushioning effect to the apparatus held.

2.5 Rod — A vertical circular bar on which slides the boss-head for being fixed at any desired position.

3. MATERIAL

3.1 The material used for the different components shall be as given below:

<i>Component</i>	<i>Material</i>	<i>Specification</i>
i) Base	Cast iron	Grade FG 200 of IS : 210-1978*
ii) Bolt and bolt head	a) Mild steel or b) Brass	Property Class 4.6 of IS : 1367 (Part 3)- 1979†
iii) Boss-head	a) Cast iron or b) Aluminium alloy	Grade FG 200 of IS : 210-1978* IS : 617-1975‡
iv) Clamp	a) Aluminum alloy or b) Mild steel	IS : 617-1975‡ IS : 1367 (Part 3)- 1979†
v) Lining	a) Rubber or b) Cork sheet or c) Felt	Type B of IS : 638-1979§
vi) Fly nut	a) Mild steel or b) Brass	Property Class 4.6 of IS : 1367 (Part 3)- 1979†
vii) Pin	Mild steel	IS : 226-1975
viii) Rod	Mild steel	IS : 226-1975
ix) Screw	Mild steel	IS : 1367 (Part 3)- 1979†
x) Spring	Carbon steel	IS : 4454 (Part 1)- 1981¶
xi) Washers	Mild steel	IS : 226-1975

*Specification for grey iron castings (*third revision*).

†Technical supply conditions for threaded fasteners (*first revision*).

‡Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

§Specification for sheet rubber jointing and rubber insertion jointing (*second revision*).

||Specification for structural steel (standard quality) (*fifth revision*).

¶Specification for steel wires for cold formed springs : Part 1 Patented and cold drawn steel wires — unalloyed (*second revision*).

4. GENERAL REQUIREMENTS

4.1 The base of the stand can be of any suitable shape, recommended shapes are rectangular, square and triangular.

4.2 The weight of the base shall be not less than 2 kg.

4.3 The length and other dimensions of the vertical rod shall be as given in Fig. 2. The rod shall be screwed to the base.

4.4 The minimum thickness of the base shall be 10 mm. In the case of rectangular base, the material thickness at the particular spot where the vertical rod is to be mounted, shall be increased to 15 mm, *Min* to provide sufficient strength to hold the rod tightly.

4.4.1 The base shall stand firmly and squarely on its legs/feet.

4.4.2 It shall show no tendency to tilt when pressed at any point when placed on reasonably flat surface.

4.4.3 When placed on horizontal flat surface, the top flat surface shall be reasonably levelled.

4.4.4 When a laboratory stand is placed on a horizontal flat surface, the rod shall show no visible deviation from the vertical.

4.5 The boss head shall slide smoothly over the entire length of the rod and it shall be possible to tighten it at any desired height by means of M4 wing screws conforming to IS : 3727-1966*.

4.6 The boss-head shall be so designed that it is possible to use any of its two open ends to tighten it rigidly against the vertical rod or clamp rod.

4.7 The length of the clamp measured from the end of its jaws to the end of the clamp rod shall not less than 200 mm and not more than 300 mm.

4.8 The jaws of the clamp shall show no relative displacement when opened or closed in any direction other than the direction of closing/opening.

4.9 The clamp jaws shall be suitably designed to provide adequate point line or surface contact to the apparatus so as to hold it firmly. Suitably adhered lining, such as cork felt or rubber shall be provided on the clamp jaws to give cushioning effect to the apparatus.

4.10 The clamp jaws in the fully closed condition shall be able to firmly held any object having a diameter of less than 12.5 mm.

*Specification for wing screws.

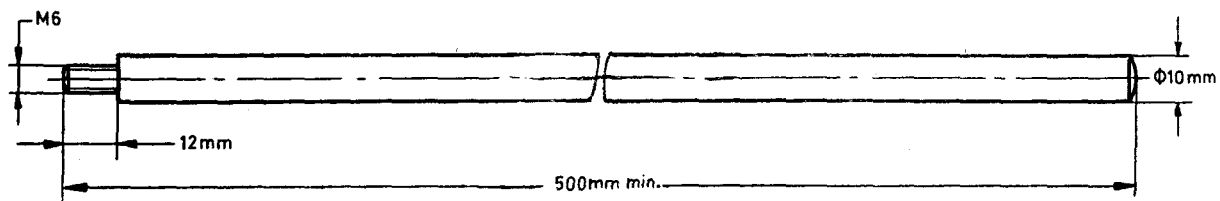


FIG. 2 VERTICAL ROD

4.11 The clamp shall be able to firmly hold a laboratory apparatus having diameter of not less than 30 mm.

5. WORKMANSHIP AND FINISH

5.1 All the components shall be given a smooth and permanent finish and suitable treatment for protection against rust and other deterioration in all types of climate.

6. TESTS

6.1 When tested with one-litre round bottom flask (full of water) held between the clamp towards the longer axis of the base with jaws just extending beyond the opposite edge of the base at the maximum height of the vertical rod, the laboratory stand shall not topple.

7. ACCESSORIES

7.1 If required by the purchaser, the stand shall be supplied with a set of three cast iron support rings (each being integral with the boss-head) having internal diameter of 5, 7.5 and 10 cm. Each ring shall be 6 mm thick with three projections on the inside of the ring for supporting the glasswares properly. The shank length of each ring may be suitably varied to enable the three rings to be concentrically mounted with their centres 12.5 mm from the centre of the rod.

NOTE — A large number of accessories may be required for use with stand for various applications in a laboratory. For instance, various types and sizes of clamps may be needed to suit the requirements of clamping or support for special purposes. All such accessories may be supplied depending upon the user's requirements.

8. MARKING

8.1 Each stand shall be marked with the manufacturer's name and trade-mark, if any, batch number and the year of manufacture.

8.1.1 Laboratory stand may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. SAMPLING

9.1 Unless otherwise agreed to between the buyer and the supplier, the sampling plan as given in Appendix A shall be followed. For further information reference may be made to IS : 2500 (Part 1)-1973*.

APPENDIX A

(Clause 9.1)

SAMPLING PROCEDURE AND CRITERIA FOR CONFORMITY

A-1. LOT

A-1.1 All the laboratory stands produced under similar conditions from the same raw material shall constitute a lot.

A-2. NUMBER OF TESTS

A-2.1 The number of laboratory stands to be selected from each lot for testing shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLING SIZE AND CRITERIA FOR CONFORMITY

LOT SIZE (1)	SAMPLE SIZE (2)	ACCEPTANCE NUMBER (3)
Up to 25	5	0
26 to 50	8	0
51 to 100	13	1
101 to 150	20	1
151 to 300	32	2
301 and above	50	3

A-2.2 These laboratory stands shall be selected from the lot at random and in order to ensure the randomness of selection procedures given in IS : 4905-1968† may be followed.

A-3. CRITERIA FOR CONFORMITY

A-3.1 The number of stands selected at random in accordance with col 2 of Table 1 shall be tested for general requirements (**4.1** to **4.11**), the workmanship and finish (**5.1**) and the test given in **6.1**. The lot shall be considered as conforming to these requirements if the number of defectives found in the sample is less than or equal to the corresponding acceptance number of defectives as given in col 3 of Table 1.

*Sampling inspection tables : Part 1 Inspection by attributes and by count of defects (first revision).

†Methods for random sampling.

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²